

=> file reg

FILE 'REGISTRY' ENTERED AT 15:37:06 ON 19 APR 2006
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L1 FILE 'LREGISTRY' ENTERED AT 15:05:05 ON 19 APR 2006
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L2 FILE 'REGISTRY' ENTERED AT 15:28:31 ON 19 APR 2006
50 S L1

L3 FILE 'HCAPLUS' ENTERED AT 15:29:34 ON 19 APR 2006
20940 S ADACHI ?/AU
L4 41566 S FUJITA ?/AU
L5 330 S L3 AND L4
L6 2452 S ADACHI M?/AU
L7 4694 S FUJITA S?/AU
L8 38 S L6 AND L7
L9 231740 S BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY? OR
L10 37 S L8 AND L9
SEL L10 1-37 RN

L11 FILE 'REGISTRY' ENTERED AT 15:31:23 ON 19 APR 2006
167 S E1-E167
L12 12 S L11 AND B/ELS
L13 12 S L11 AND P/ELS
L14 68 S L11 AND LI/ELS
L15 10 S L12 AND L14
L16 8 S L13 AND L14
L17 3 S L15 AND RSD/FA
L18 4 S L16 AND RSD/FA
SEL L17 3 RN
L19 1 S E168
SEL L18 4 RN
L20 1 S E169

L21 FILE 'HCA' ENTERED AT 15:35:18 ON 19 APR 2006
26 S L19
L22 6 S L20
L23 21 S L21 AND L9
L24 5 S L22 AND L9
L25 24 S L23 OR L24

L26 22 S L25 AND (1840-2002/PY OR 1840-2002/PRY)

=> file hca

FILE 'HCA' ENTERED AT 15:37:16 ON 19 APR 2006

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L26 ANSWER 1 OF 22 HCA COPYRIGHT 2006 ACS on STN

141:426346 Non-aqueous electrolyte secondary **battery**.

Iwamoto, Kazuya; Koshina, Hizuru; Shimamura, Harunari; Nitta, Yoshiaki (Matsushita Electric Industrial Co., Ltd., Japan). U.S. US 6824920 B1 20041130, 14 pp., Cont.-in-part of U.S. 6,090,505.

(English). CODEN: USXXAM. APPLICATION: US 2000-601421 20000928.

PRIORITY: JP 1997-144873 19970603; JP 1998-123199 19980506; US 1998-90484 19980603; JP 1998-342887 19981202; JP 1998-342888 19981202; WO 1999-JP6689 19991130.

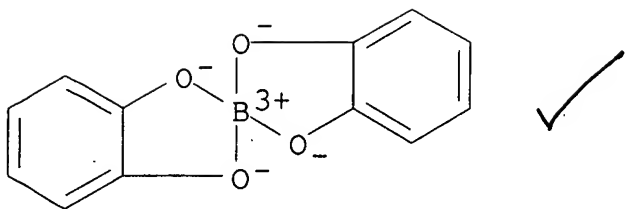
AB A nonaq. electrolyte secondary **battery** consists of a cathode, an anode capable of intercalating and de-intercalating lithium, a non-aq. electrolyte soln., and a separator or a solid electrolyte. The anode consists of composite particles made of tin, silicon or zinc coated with a solid soln. or an intermetallic compd. The intermetallic compd. contains Sn, Si, or Zn and an addnl. elements, such as Mg, Fe, Mo, Zn, Cd, In, Pb, Co, Ni, Al, Sn, Cu, V, or Ge. The electrolyte consists of a lithium salts of an org. acid dissolved in an org. solvent with high oxidn. resistant characteristics. The lithium salts of an org. acid can be bistrifluoromethane sulfonic acid imido lithium, bis[1,2-benzenediolato(2-)-O,O'] lithium borate, bis[2,3-naphthalenediolato(2-)-O,O'] lithium borate, lithium bis(2,2'-biphenylene)borate, or bis(5-fluoro-2-olate-1-benzenesulfonic acid-O,O') lithium borate. The non-aq. electrolyte can contain ethylene carbonate, di-Me carbonate, di-Et carbonate, ethylmethyl carbonate, propylene carbonate, .gamma.-butyro lactone, or .gamma.-valero lactone.

IT 156762-86-6

(electrolyte; non-aq. electrolyte secondary **battery**)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



●.Li⁺

IT 156762-86-6

(electrolyte; non-aq. electrolyte secondary **battery**)

L26 ANSWER 2 OF 22 HCA COPYRIGHT 2006 ACS on STN

140:166762 Secondary lithium **battery** with electrolyte containing borate or phosphate complex salt. Adachi, Momoe; Fujita, Shigeru (Sony Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2004047231 A2 20040212, 19 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-201686 20020710.

AB The claimed **battery** is equipped with an anode showing its capacity as total of light metal intercalation and pptn. and dissoln. of a light metal and an electrolyte contg. a light metal salt having MO bond (M = B, P, Al, Ga, In, Tl, As, Sb, or Bi). Preferably, the light metal salt is selected from lithium bis[1,2-benzenediolato(2-)-0,0'] borate and lithium tris[1,2-benzenediolato(2-)-0,0']phosphate. Preferably, the anode contains graphite. The anode may contain Sn, Pb, Al, In, Si, Zn, Sb, Bi, Cd, Mg, B, Ga, Ge, As, Ag, Zr, Y, and/or Hf, its alloy, or its compd. The **battery** provides high capacity, long cycle life, and storage stability.

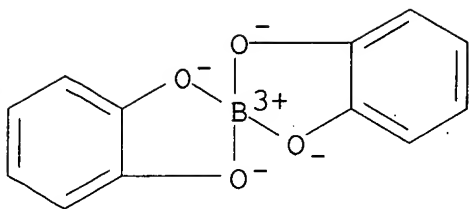
IT 156762-86-6 220289-38-3

(secondary lithium **battery** with electrolyte contg. borate or phosphate complex salt)

RN 156762-86-6 HCA

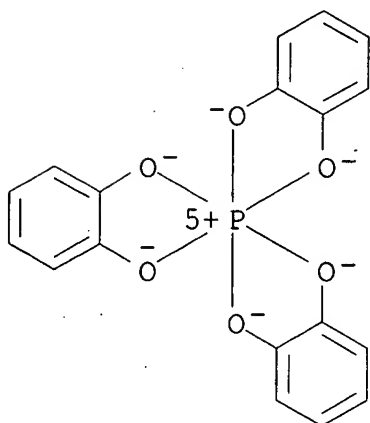
CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)

pub 2004 Feb 12



● Li⁺

RN 220289-38-3 HCA
 CN Phosphate(1-), tris[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-,
 lithium, (OC-6-11)- (9CI) (CA INDEX NAME)



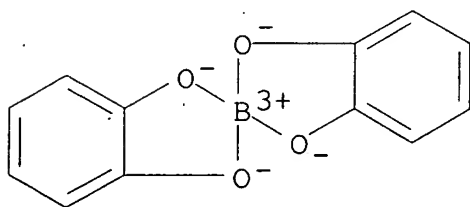
● Li⁺

IT 156762-86-6 220289-38-3
 (secondary lithium **battery** with electrolyte contg.
 borate or phosphate complex salt)

L26 ANSWER 3 OF 22 HCA COPYRIGHT 2006 ACS on STN
 139:9312 Method of preparation of phosphorus borates with low melting
 points for use in electrochemical devices. Schmidt, Michael;
 Welz-Biermann, Urs; Vaughan-Spickers, Julian; Seddon, Ken; Downhard,
 Andrew (Merck Patent G.m.b.H., Germany). PCT Int. Appl. WO
 2003045960 A1 20030605, 24 pp. DESIGNATED STATES: W: AE, AG, AL,
 AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ,

DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-EP12163 20021031. PRIORITY: EP 2001-127468 20011128.

- AB The present invention relates to phosphorous borates, methods for their prepn. and to the use of these salts in primary **batteries**, secondary **batteries**, capacitors, supercapacitors and/or **galvanic cells**. Furthermore, the present invention relates to the use of these salts as hydraulic liq., conducting salt, catalyst, solvent, electrolyte or starting compd.
- IT **156762-86-6P**
(method of prepn. of phosphorus borates with low m.ps. for use in electrochem. devices)
- RN 156762-86-6 HCA
- CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



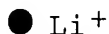
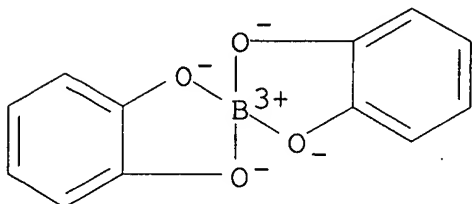
● Li⁺

- IT **156762-86-6P**
(method of prepn. of phosphorus borates with low m.ps. for use in electrochem. devices)
- L26 ANSWER 4 OF 22 HCA COPYRIGHT 2006 ACS on STN
- 138:404375 Electrolyte mixtures for lithium **batteries**. Birke, Peter; Salam, Fatima (Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung e.V., Germany). Ger. Offen. DE 10154912 A1 20030605, 8 pp. (German). CODEN: GWXXBX. APPLICATION: DE 2001-10154912 20011108.
- AB The invention concerns an electrolyte mixt., contg. at least two conducting salts and/or four solvents, as well as a **battery** which contains this electrolyte mixt.

IT 156762-86-6

(electrolyte mixts. for lithium **batteries**)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-,
lithium, (T-4)- (9CI) (CA INDEX NAME)

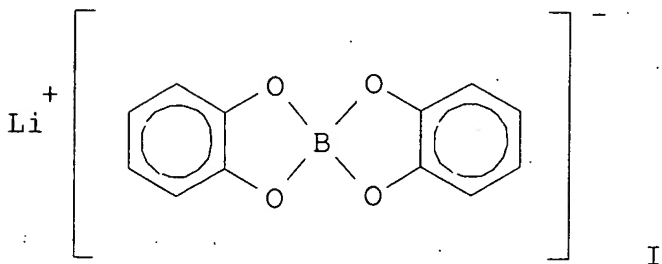
IT 156762-86-6

(electrolyte mixts. for lithium **batteries**)

L26 ANSWER 5 OF 22 HCA COPYRIGHT 2006 ACS on STN

136:40214 Nonaqueous electrolyte **battery**. Kawaguchi,
Shinichi; Takahashi, Tadayoshi; Koshiba, Nobuharu (Matsushita
Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP
2001351640 A2 **20011221**, 5 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 2000-170121 20000607.

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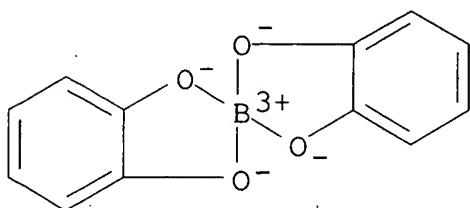
AB The **battery** uses a Li or Li alloy anode and a nonaq.
electrolyte soln. contg. a supporting electrolyte I dissolved in a
nonaq. carbonate solvent.

IT 156762-86-6

(lithium bis(1,2-benzenediolato)borate electrolyte solns. for secondary lithium **batteries**)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT 156762-86-6

(lithium bis(1,2-benzenediolato)borate electrolyte solns. for secondary lithium **batteries**)

L26 ANSWER 6 OF 22 HCA COPYRIGHT 2006 ACS on STN

135:291215 Application to lithium **battery** electrolyte of lithium chelate compound with boron. Sasaki, Y.; Handa, M.; Sekiya, S.; Kurashima, K.; Usami, K. (Faculty of Engineering, Department of Applied Chemistry, Tokyo Institute of Polytechnics, Kanagawa, Atsugi, 243-0297, Japan). Journal of Power Sources, 97-98, 561-565 (English) 2001. CODEN: JPSODZ. ISSN: 0378-7753. Publisher: Elsevier Science S.A..

AB The electrolytic conductivities and charge-discharge characteristics of lithium electrode are examd. in propylene carbonate (PC)- and ethylene carbonate (EC) and tetrahydrofurans, such as 2-methyltetrahydrofuran (2-MeTHF) and 2,5-dimethyltetrahydrofuran (2,5-DMeTHF), binary solvent electrolytes contg. lithium bis[1,2-benzenediolato(2-)-O,O']borate (LBBB), lithium bis[2,3-naphthalenediolato(2-)-O,O']borate (LBNB), lithium bis[2,2'-biphenyldiolato(2-)-O,O']borate (LBBPB) and lithium bis[salicylato(2-)]borate (LBSB). The order of specific conductivities in PC- and EC-based equimolar binary solns. contg. these org. borates is LBBB>LBNB>LBSB>LBBPB. The cond. in LBNB electrolyte with higher viscosity than that in LBSB electrolyte becomes high. The PC-2-MeTHF and PC-2,5-DMeTHF equimolar binary solns. contg. LBSB and a mixed electrolyte (LBBPB+LiPF₆) show very high cycling efficiencies more than 90% at a higher range of cycle no. The EC-THF and EC-2-MeTHF equimolar binary solns. are moderate electrolytes with about 80% cycling efficiencies. It is found by

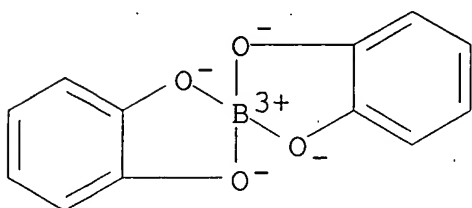
using scanning electron microscope (SEM) that the films formed on the electrode in PC-2-MeTHF and PC-2,5-DMeTHF electrolytes with higher cycling efficiencies have a homogeneous surface with uniform grain size.

IT **156762-86-6**

(**battery** electrolyte of lithium chelate compd. with boron)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT **156762-86-6**

(**battery** electrolyte of lithium chelate compd. with boron)

L26 ANSWER 7 OF 22 HCA COPYRIGHT 2006 ACS on STN

133:225580 Use of additives in electrolytes for improved performance of **electrochemical cells**. Heider, Udo; Schmidt, Michael; Amann, Anja; Niemann, Marlies; Kuhner, Andreas (Merck Patent G.m.b.H., Germany). Eur. Pat. Appl. EP 1035612 A1 **20000913**, 26 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (German). CODEN: EPXXDW. APPLICATION: EP 2000-102355 20000204. PRIORITY: DE 1999-19910968 19990312.

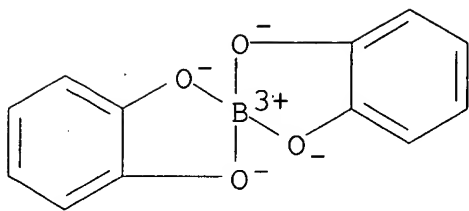
AB **Battery** electrolyte comprising an aprotic solvent with dissolved Li contg. inorg. or org. salts from the group of methanides, triflates, and imides includes .gtoreq.1 O, eg. alkali metal salt additive. The additive is selected from the groups of org. alkali metal borate or alkali metal alcoholate.

IT **156762-86-6**

(use of additives in electrolytes for improved performance of **electrochem. cells**)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT 156762-86-6

(use of additives in electrolytes for improved performance of **electrochem. cells**)

L26 ANSWER 8 OF 22 HCA COPYRIGHT 2006 ACS on STN

133:61293 Application to lithium **battery** electrolytes of lithium organoborate complexes. Handa, M.; Sekiya, S.; Kurashima, K.; Usami, K.; Sasaki, Y. (Department of Applied Chemistry, Faculty of Engineering, Tokyo Institute of Polytechnics, Kanagawa, 243-0297, Japan). Proceedings - Electrochemical Society, 99-25, 485-493 (English) 2000. CODEN: PESODO. ISSN: 0161-6374. Publisher: Electrochemical Society.

AB The possibility as useful lithium **battery** electrolytes of lithium organoborate complexes based on a chelate-type anion such as lithium bis[1,2-benzenediolato(2-)-O,O']borate (LBBB), lithium bis[2,3-naphthalenediolato(2-)-O,O']borate (LBNB), lithium bis[2,2'-biphenyldiolato(2-)-O,O']borate (LBBPB) and lithium bis[salicylato(2-)]borate (LBSB) are studied. The electrolytic behavior and charge-discharge characteristics of lithium electrodes are examd. in propylene carbonate and ethylene carbonate -based binary and ternary solvent electrolytes contg. LBBB, LBNB, LBBPB and LBSB in comparison with common lithium salts such as LiClO₄, LiPF₆, LiBF₄ and LiCF₃SO₃. Lithium cycling efficiencies due to the lithium deposition and dissoln. processes on a Ni electrode in LBBB, LBNB, LBBPB and LBSB solns. are highly stable at higher cycle nos. LBBPB and LiPF₆ mixed salt of propylene carbonate - 2,5-dimethyltetrahydrofuran soln. shows the highest efficiency more than 90%. On the electrode surface homogeneous distribution are shown with scanning electron microscope.

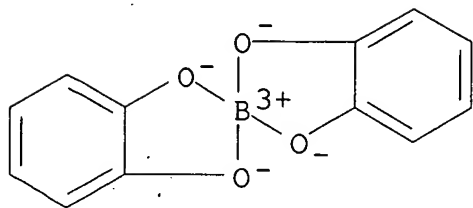
IT 156762-86-6

(lithium **battery** electrolytes of lithium organoborate complexes)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-,

lithium, (T-4)- (9CI) (CA INDEX NAME)

● Li⁺

IT 156762-86-6

(lithium **battery** electrolytes of lithium organoborate complexes)

L26 ANSWER 9 OF 22 HCA COPYRIGHT 2006 ACS on STN

133:20102 Non-aqueous electrolyte secondary **battery** with improved anode and its charging method. Iwamoto, Kazuya; Koshina, Hizuru; Shimamura, Harunari; Nitta, Yoshiaki (Matsushita Electric Industrial Co., Ltd., Japan). PCT Int. Appl. WO 2000033403 A1 **20000608**, 35 pp. DESIGNATED STATES: W: US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (Japanese). CODEN: PIXXD2. APPLICATION: WO 1999-JP6689 19991130. PRIORITY: JP 1998-342887 19981202; JP 1998-342888 19981202.

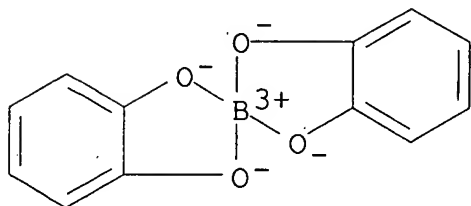
AB The nonaq. electrolyte secondary **battery** is characterized in that the neg. plate is made chiefly of composite particles of which at least part of the core particles contg. .gtoreq.1 kind among Sn, Si, and Zn as a constituent element are coated with a solid soln. or an intermetallic compd. consisting of the constituent element constituting the core particles and .gtoreq.1 element selected from the group consisting of Group 2 elements of the periodic table except the constituent element, transition elements, Group 12 elements, Group 13 elements, and Group 14 elements except C and in that the nonaq. electrolyte is prepd. by dissolving an org. acid anion Li salt into a highly nonoxidizable org. solvent. Therefore, gas is hardly produced even while the **secondary cell** is stored at high temps., and the secondary **battery** has a high energy d., excellent cycle life characteristics, and excellent high-rate charging/discharging characteristics.

IT 156762-86-6

(non-aq. electrolyte secondary **battery** with improved anode and charging method)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT 156762-86-6

(non-aq. electrolyte secondary **battery** with improved anode and charging method)

L26 ANSWER 10 OF 22 HCA COPYRIGHT 2006 ACS on STN

132:224803 Solid-state ion-conducting polymer compositions containing boron compounds for **batteries**. Edo, Takashi; Imai, Takashi; Miyata, Hiroyuki; Watanabe, Masayoshi (Fujikura Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000080265 A2 **20000321**, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-250091 19980903.

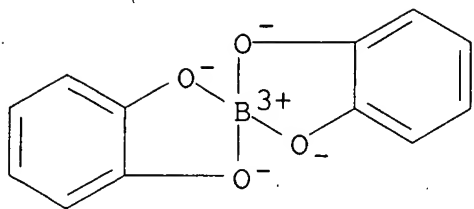
AB The compns. comprise ion-conducting polymers and alkali metal salts of benzene ring- and/or naphthalene ring-contg. B compds. The compns. are esp. suitable for electrolytes of Li ion **batteries**. Thus, a thin film contg. polyoxyethylene and lithium bis[1,2- benzenediolato(2-)-O,O']borate showed high ion cond. and cation transference.

IT 156762-86-6

(solid-state ion-conducting polymer compns. contg. benzene- and/or naphthalene ring-contg. boron compds. for **batteries**)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT 156762-86-6

(solid-state ion-conducting polymer compns. contg. benzene- and/or naphthalene ring-contg. boron compds. for **batteries**)

L26 ANSWER 11 OF 22 HCA COPYRIGHT 2006 ACS on STN

132:4808 Organic lithium phosphate, its manufacture, and nonaqueous electrolyte and secondary nonaqueous-electrolyte lithium

battery using it. Sasaki, Sachio; Yamaguchi, Hiroyuki

(Kanto Kagaku K. K., Japan). Jpn. Kokai Tokkyo Koho JP 11335382 A2 19991207 Heisei, 7 pp. (Japanese). CODEN: JKXXAF.

APPLICATION: JP 1998-156882 19980522.

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* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

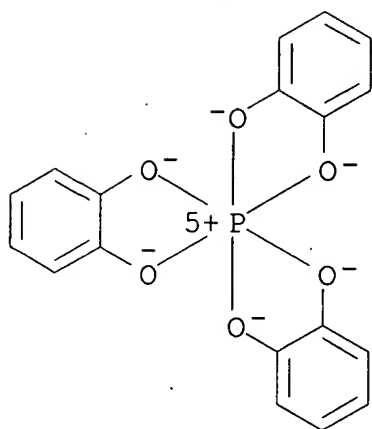
AB An org. Li phosphate has a general formula I [R1-4 = H, halo, (halo-substituted) C1-3 hydrocarbyl; R1-4 may connect to each other to form C chains]. The org. Li phosphate is prepd. by the following steps: (1) conducting a reaction of PCl₅ with a catechol deriv. II to prep. a compd. III and then (2) conducting a reaction of an alkyl Li with the compd. III. The title electrolyte contg. the org. Li phosphate and **battery** using the electrolyte are also claimed. The org. Li phosphate has high oxidn. decompn. potential.

IT 220289-38-3P, Lithium tris[1,2-benzenediolato(2-)-O,O']phosphate

(prepn. of org. Li phosphate with high oxidn. decompn. potential for nonaq. electrolyte for Li **battery**)

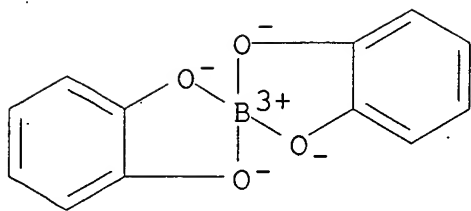
RN 220289-38-3 HCA

CN Phosphate(1-), tris[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (OC-6-11)- (9CI) (CA INDEX NAME)



● Li⁺

- IT **220289-38-3P**, Lithium tris[1,2-benzenediolato(2-)-O,O']phosphate
(prepn. of org. Li phosphate with high oxidn. decompn. potential for nonaq. electrolyte for Li **battery**)
- L26 ANSWER 12 OF 22 HCA COPYRIGHT 2006 ACS on STN
131:259970 Solid polymer electrolyte **batteries** and their manufacture. Maeda, Shiori; Yamazaki, Mikiya; Fujii, Takanori; Nakane, Ikuro; Oikawa, Kuni (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11283673 A2 **19991015** Heisei, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-85813 19980331.
- AB The **batteries** have a polymer gel electrolyte membrane, contg. an electrolyte soln., between a cathode and a carbonaceous anode; where the electrolyte soln. contains an org. solvent and a Li salt, except LiBF₄, that does not hydrolyze at .ltoreq.100.degree.. The **batteries** are prepd by inserting the carbonaceous anode and a cathode in a **battery** case, with a spacer between the electrodes, injecting a pre-gel electrolyte soln. contg. a polymerizable compd. in the case, and heating the case to polymerize the compd. to form the gel electrolyte.
- IT **156762-86-6**
(polymer gel electrolytes contg. hydrolysis resistant lithium salts for secondary lithium **batteries**)
- RN 156762-86-6 HCA
- CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT 156762-86-6

(polymer gel electrolytes contg. hydrolysis resistant lithium salts for secondary lithium **batteries**)

L26 ANSWER 13 OF 22 HCA COPYRIGHT 2006 ACS on STN

131:47168 Nonaqueous electrolyte compositions. Heider, Udo; Wenige, Roger; Pohl, Ludwig; Niemann, Marlies; Jungnitz, Michael (Merck Patent G.m.b.H., Germany). Ger. Offen. DE 19757126 A1 **19990624**, 6 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1997-19757126 19971220.

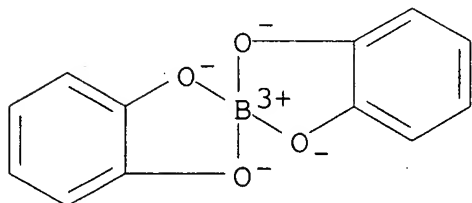
AB Nonaq. electrolyte compns. comprise .gtoreq.1 conductor compd. dissolved in a mixt. of .gtoreq.2 nonaq. solvents. The compn. of the electrolyte lies in the range of +10 mol% to -10 mol% of eutectic electrolyte compn. The electrolyte is suitable for primary or secondary **batteries**, a condenser, or a **galvanic cell**.

IT 156762-86-6

(nonaq. electrolyte compns.)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT 156762-86-6

(nonaq. electrolyte compns.)

L26 ANSWER 14 OF 22 HCA COPYRIGHT 2006 ACS on STN

131:47095 Chelate complexes with boron as lithium salts for lithium **battery** electrolytes. Sasaki, Yukio; Sekiya, Satoshi; Handa, Minoru; Usami, Kyohei (Department of Industrial Chemistry, Faculty of Engineering, Tokyo Institute of Polytechnics, Atsugi, Kanagawa, 243-0297, Japan). Journal of Power Sources, 79(1), 91-96 (English) 1999. CODEN: JPSODZ. ISSN: 0378-7753. Publisher: Elsevier Science S.A..

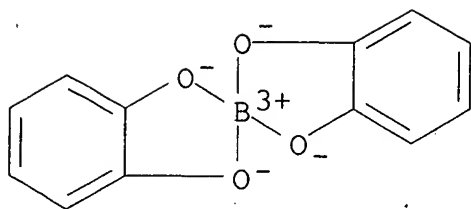
AB The electrolytic cond. and charge-discharge characteristics of lithium electrodes are examd. in propylene carbonate (PC)- and ethylene carbonate (EC)-based binary solvent electrolytes contg. lithium bis[1,2-benzenediolato(2-)-O,O']borate (LBBB), lithium bis[2,3-naphthalenediolato(2-)-O,O']borate (LBNB) and lithium bis[2,2'-biphenyldiolato(2-)-O,O']borate (LBBPB). The LBBPB exhibits high thermal and electrochem. stability compared with LBBB and LBNB. Conductivities in PC-THF and EC-THF binary solvent electrolytes at XTHF (mole fraction of THF) = 0.5 contg. 0.5M LBBB and LBNB are nearly equal to that in 0.5M LiCF₃SO₃ electrolyte as a typical lithium **battery** electrolyte. The cond. in 0.3M LBBPB/PC-DME (DME: 1,2-dimethoxyethane) electrolyte is fairly low compared with that in other electrolytes. The energy d. with the LBNB electrolyte is higher than that with LBBB or LBBPB electrolyte. In general, lithium cycling efficiencies in THF-based LBBB and LBNB electrolytes become higher than those in DME-based electrolytes. The 0.5M LBNB/PC-THF electrolyte is a moderately rechargeable lithium **battery** electrolyte. The 0.3M LBBPB/PC-DME equimolar solvent electrolyte displays the highest cycling efficiency, viz., >70%, at a high range of cycle no.

IT 156762-86-6

(chelate complexes with boron as lithium salts for lithium **battery** electrolytes)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT 156762-86-6

(chelate complexes with boron as lithium salts for lithium
battery electrolytes)

L26 ANSWER 15 OF 22 HCA COPYRIGHT 2006 ACS on STN

130:299271 Electrolytic behavior and application to lithium

batteries of chelate complexes with boron as lithium salts.

Sasaki, Y.; Fukuda, S.; Hanada, M.; Usami, K. (Dept. of Industrial Chemistry, Fac. of Engineering, Tokyo Institute of Polytechnics, Kanagawa, 243-0297, Japan). Progress in Batteries & Battery Materials, 17, 232-234 (English) 1998. CODEN: PBBMEF.

ISSN: 1099-4467. Publisher: ITE-JEC Press Inc..

AB The electrolytic behavior and charge-discharge characteristics are examd. for Li electrodes in propylene carbonate-THF and ethylene carbonate-THF binary solvent electrolytes contg. Li bis[1,2-benzenediolato(2-)-O,O']borate and Li bis[2,3-naphthalenediolato(2-)-O,O']borate (I) in comparison with those in PC-DME and EC-DME binary solvent electrolytes. The I/PC-THF and EC-THF equimolar solvent electrolytes with moderate conductivities and higher Li cycling efficiencies are good electrolyte for Li **batteries**.

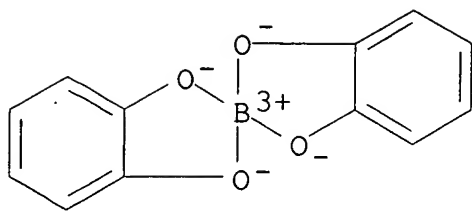
IT 156762-86-6

(electrolytic behavior and application to lithium

batteries of chelate complexes with boron as lithium salts)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT 156762-86-6

(electrolytic behavior and application to lithium **batteries** of chelate complexes with boron as lithium salts)

L26 ANSWER 16 OF 22 HCA COPYRIGHT 2006 ACS on STN

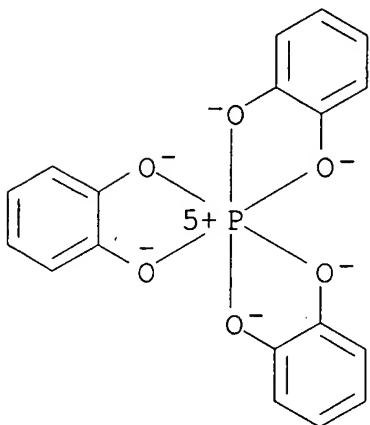
130:156006 A new lithium salt with a chelate complex of phosphorus for lithium **battery** electrolytes. Handa, M.; Suzuki, M.; Suzuki, J.; Kanematsu, H.; Sasaki, Y. (Department of Industrial Chemistry, Faculty of Engineering, Tokyo Institute of Polytechnics, Kanagawa, 243-0297, Japan). *Electrochemical and Solid-State Letters*, 2(2), 60-62 (English) **1999**. CODEN: ESLEF6. ISSN: 1099-0062. Publisher: Electrochemical Society.

AB A new Li salt, lithium tris[1,2-benzenediolato(2)-O,O']phosphate, was synthesized and utilized in Li **battery** electrolytes for Li/V2O5 cells. This Li salt has a hexacoordinated chelate-type phosphorus anion produced from a pentacoordinated organophosphorus compd. as a useful intermediate. It is thermally stable due to the chelating effect with the bidentate ligands of the anion which is a feature distinct from the common Li **battery** salt LiPF6. The thermal decompn. temp. is higher than that of the pentacoordinated intermediate, and the decompn. process is proven to occur in two steps with release of the benzene moiety from the anion. The specific cond. (3.89 mS cm⁻¹) in an ethylene carbonate-tetrahydrofuran binary mixt. (mole fraction of THF is 0.7) is somewhat low, which can be explained by their high viscosities based on the large anion size. In spite of the low cond., the discharge capacity approaches the theor. value, and a high energy d. (410 Wh kg⁻¹) is obtained for a Li/V2O5 cell discharged to a cutoff potential of 2.5 V vs. Li/Li⁺.

IT **220289-38-3P**, Lithium tris[1,2-benzenediolato(2)-O,O']phosphate

(lithium salt with chelate complex of phosphorus for lithium **battery** electrolytes)

RN 220289-38-3 HCA
 CN Phosphate(1-), tris[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-,
 lithium, (OC-6-11)- (9CI) (CA INDEX NAME)

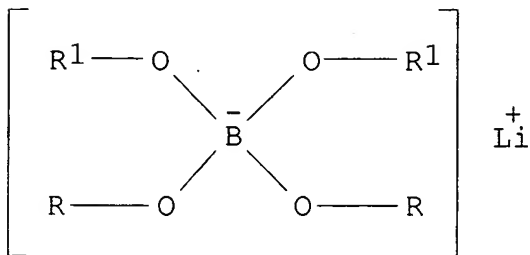


● Li⁺

IT 220289-38-3P, Lithium tris[1,2-benzenediolato(2)-
 O,O']phosphate
 (lithium salt with chelate complex of phosphorus for lithium
battery electrolytes)

L26 ANSWER 17 OF 22 HCA COPYRIGHT 2006 ACS on STN
 128:180516 Procedure for production of new lithium-borate complex.
 Barthel, Josef; Bustrich, Ralf (Merck Patent G.m.b.H., Germany).
 Ger. Offen. DE 19633027 A1 **19980219**, 8 pp. (German).
 CODEN: GWXXBX. APPLICATION: DE 1996-19633027 19960816.

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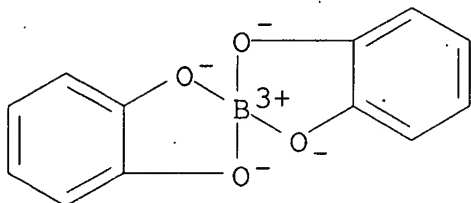
AB Prepn. of title compds. I (R, R1 = same or different, Ph, naphthyl, anthracenyl, phenanthrenyl, etc.), useful as electrolyte in secondary lithium **battery**, is described. Thus, reaction of lithium tetramethanolatoborate with 2,2'-dihydroxybiphenyl in MeCN gave title compd., lithium bis[2,2'-biphenyldiolato(2-)-O,O'-borate(1-)].

IT **156762-86-6P**

(procedure for prodn. of new lithium-borate complex)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT **156762-86-6P**

(procedure for prodn. of new lithium-borate complex)

L26 ANSWER 18 OF 22 HCA COPYRIGHT 2006 ACS on STN

128:24887 A new class of electrochemically and thermally stable lithium salts for lithium **battery** electrolytes. Barthel, J.; Buestrich, R.; Gores, H. J.; Schmidt, M.; Wuhr, M. (Institut fur Theoretische und Physikalische Chemie der Universitat Regensburg, Regensburg, D-93040, Germany). Journal of the Electrochemical Society, 144(11), 3866-3870 (English) **1997**. CODEN: JESQAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

AB Synthesis, anal., and purifn. of lithium bis[2,2'-biphenyldiolato(2-)-O,O']borate, lithium bis[salicylato(2-)]-borate, lithium phenolate, and dilithium-2,2'-biphenyldiolate are described. Electrochem. studies show that lithium organoborates are subject to anodic decompn. mechanisms, which depend on their chem. structure. The anodic decompn. of lithium benzenediolatoborates results in the formation of sol. products including quinones, whereas the anodic oxidn. of lithium bis[2,2'-biphenyldiolato(2-)-O,O']borate, lithium bis[salicylato(2-)]borate, and lithium phenolates entails the formation of thin electronically insulating lithium ion-conducting polymer films, preventing further anion decompn. as well as anodic

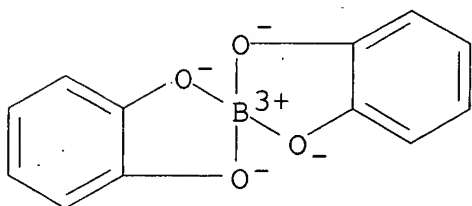
decompn. of solvents which are sensitive to oxidn. These film-forming materials are useful to enlarge the electrochem. window of electrolyte solns. for lithium **batteries** and electrochem. capacitors.

IT **156762-86-6**

(new class of electrochem. and thermally stable lithium salts for lithium **battery** electrolytes)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT **156762-86-6**

(new class of electrochem. and thermally stable lithium salts for lithium **battery** electrolytes)

L26 ANSWER 19 OF 22 HCA COPYRIGHT 2006 ACS on STN

127:334025 Use of a chelate complex with boron as a lithium salt for lithium **battery** electrolytes. Handa, M.; Fukuda, S.; Sasaki, Y.; Usami, K. (Dep. of Ind. Chem., Fac. of Eng., Tokyo Inst. of Polytechnics, Atsugi, 243-02, Japan). Journal of the Electrochemical Society, 144(9), L235-L237 (English) **1997**. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

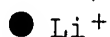
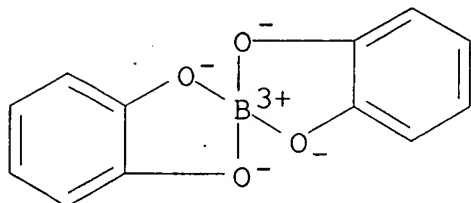
AB A chelate complex with boron, lithium bis[2,3-naphthalenediolato(2-)-O,O'] borate was used in lithium **battery** electrolytes for Li/V2O5 prototype cells. This lithium salt remains a safe and thermally stable compd. up to 320.degree.C without melting. A high specific cond. (4.63 mS cm⁻¹) is exhibited in spite of its high viscosity (1.732 cP) in a 0.5 mol dm⁻³ electrolyte/ethylene carbonate:1,2-dimethoxyethane (mol ratio 2:3) binary solvent mixt. at 25.degree.C. Based on the discharge characteristics of a Li/V2O5 prototype cell, this lithium salt electrolyte resulted in high energy d. (460 Wh kg⁻¹) at a cutoff potential of 2.5 V vs. Li/Li⁺.

IT **156762-86-6**

(boron chelate complex as lithium salt for lithium

battery electrolytes)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-,
lithium, (T-4)- (9CI) (CA INDEX NAME)

IT 156762-86-6

(boron chelate complex as lithium salt for lithium
battery electrolytes)

L26 ANSWER 20 OF 22 HCA COPYRIGHT 2006 ACS on STN

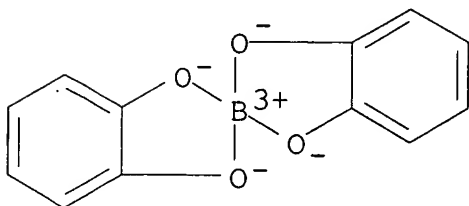
126:49149 A new class of electrochemically and thermally stable lithium salts for lithium **battery** electrolytes. II. Conductivity of lithium organoborates in dimethoxyethane and propylene carbonate. Barthel, J.; Buestrich, R.; Carl, E.; Gores, H. J. (Inst. Theor. Phys. Chem., Univ. Regensburg, Regensburg, D-93040, Germany). Journal of the Electrochemical Society, 143(11), 3565-3571 (English) 1996. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

AB A cond. study is carried out on lithium bis[1,2-benzenediolato(2-)-O,O']borate and on lithium bis[3-fluoro-1,2-benzenediolato(2-)-O,O']borate in dimethoxyethane and propylene carbonate from infinite diln. to satn. in the temp. range 228-308 K. The electron-drawing fluorine substituent produces a decrease of the assocn. const. by a factor of about 3 for propylene carbonate-based solns. and 5.5 for solns. in dimethoxyethane. The increase in the max. of cond. by .apprx.30% (propylene carbonate) and .apprx.80% (dimethoxyethane), independent of temp., reveals the effect of ion-ion interactions on the cond. max., with the solvent permittivity, viscosity, and ionic radii remaining unchanged. Synthesis, anal., and purifn. of lithium bis[3-fluoro-1,2-benzenediolato(2-)-O,O']borate, which is a candidate for lithium **batteries**, is described.

IT 156762-86-6

(cond. of electrochem. and thermally stable lithium organoborates in dimethoxyethane and propylene carbonate for lithium
battery electrolytes)

RN 156762-86-6 HCA
 CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-,
 lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT 156762-86-6
 (cond. of electrochem. and thermally stable lithium organoborates
 in dimethoxyethane and propylene carbonate for lithium
battery electrolytes)

L26 ANSWER 21 OF 22 HCA COPYRIGHT 2006 ACS on STN

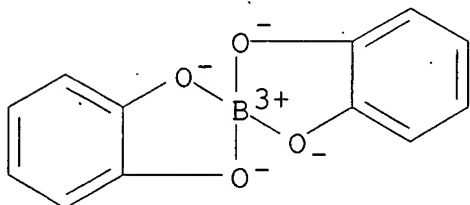
123:148925 A new class of electrochemically and thermally stable lithium salts for lithium **battery** electrolytes. I. Synthesis and properties of lithium bis[1,2-benzenediolato(2-)-O,O']borate. Barthel, J.; Wuehr, M.; Buestrich, R.; Gores, H. J. (Institut Theoretische Physikalische Chemie, Universitaet Regensburg, Regensburg, D-93040, Germany). Journal of the Electrochemical Society, 142(8), 2527-31 (English) 1995. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

AB Disclosed is a new class of nontoxic thermally, chem., and electrochem. stable, inexpensive lithium salts based on a chelate complex anion of boron with arom. or aliph. diols or carboxylic acids. The synthesis, purifn., and anal. of the first member of this class, lithium bis[1,2-benzenediolato(2-)-O,O']borate (Li[B(C₆H₄O₂)₂]) is described, and some results are given from electrochem. expts. of its soln. in various aprotic solvents. The voltage window of Li[B(C₆H₄O₂)₂]-based solns. is limited by the oxidn. of the borate at .apprx.3.6 V vs. Li. Lithium can be cycled in solns. of lithium bis[1,2-benzenediolato(2-)-O,O']borate based on different aprotic solvents. Cycling efficiencies depend strongly on the solvents used, but rarely on contact times of the soln. with lithium, or on the use of mixed electrolytes (e.g., Li[B(C₆H₄O₂)₂]/[N(CH₃)₄][B(C₆H₄O₂)₂]).

IT 156762-86-6P
 (synthesis and properties of electrochem. and thermally stable lithium benzenediol borate chelate complex for lithium

battery electrolytes)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-,
lithium, (T-4)- (9CI) (CA INDEX NAME)● Li⁺

IT 156762-86-6P

(synthesis and properties of electrochem. and thermally stable
lithium benzenediol borate chelate complex for lithium
battery electrolytes)

L26 ANSWER 22 OF 22 HCA COPYRIGHT 2006 ACS on STN

122:244103 **Battery** electrolyte. Wuehr, Manfred (Germany).Ger. Offen. DE 4316104 A1 **19941117**, 20 pp. (German).

CODEN: GWXXBX. APPLICATION: DE 1993-4316104 19930513.

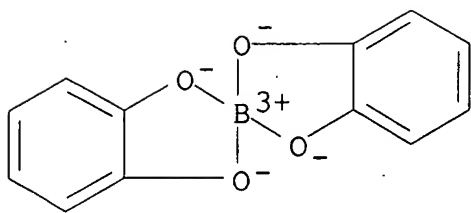
AB The stable and environmentally acceptable electrolyte for esp. Li
batteries contains a salt MBL2 in propylene carbonate or
butylene carbonate. M is Li or quaternary ammonium ion and L is a
ligand bonded to B over 2 O atoms. MBL2 is Li bis[1,2-
benzenediolato-O,O']borate LiB(C₆H₄O₂)₂, Li bis[salicylato]borate
LiB(C₇H₄O₃)₂, or tetraalkylammonium bis[1,2-benzenediolato-
O,O']borate NR₄B(C₆H₄O₂)₂ or NR₃R₁B(C₆H₄O₂)₂, where R and R₁ are
alkyls.

IT 156762-86-6P

(lithium **battery** electrolyte)

RN 156762-86-6 HCA

CN Borate(1-), bis[1,2-benzenediolato(2-)-.kappa.O,.kappa.O']-,
lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li⁺

IT 156762-86-6P
(lithium **battery** electrolyte)